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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,810	06/19/2001	Brian Rodricks	DRC-741US	3495

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RATNERPRESTIA
P.O. BOX 1596
WILMINGTON, DE 19889

EXAMINER

GAGLIARDI, ALBERT J

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 08/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/884,810

RODRICKS ET AL.

Examiner

Albert J. Gagliardi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.84(h)(5) because Figure 1 show(s) modified forms of construction in the same view (element 60 is disclosed as an equivalent electrical circuit of the pixel elements and should be designated as a separate figure). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. The examiner also notes that the specification should also be amended as necessary to reflect any drawing changes.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1-3, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikeda *et al.* (US 6,323,490 B1).

Regarding claim 1, *Ikeda* discloses (Figs. 3-4) a prior art digital x-ray imaging device comprising a top (upper) electrode layer; a dielectric layer; a sensor layer under the dielectric layer and comprising a photoconductive layer and a plurality of pixels, each pixel comprising a charge collection electrode; a thin film transistor readout matrix connected to the charge

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collection electrode; and a variable power supply adapted to provide a range of voltages between the top electrode layer and the readout matrix (see generally Fig. 3).

Regarding claim 2, *Ikeda* discloses that the variable power supply comprises a programmable power supply (see generally Fig. 3).

Regarding claim 3, *Ikeda* discloses that the photoconductive layer may comprise selenium (see generally Fig. 3).

Regarding claim 8, *Ikeda* discloses (Figs. 3-4) a prior art digital x-ray imaging device comprising a top (upper) electrode layer; a readout matrix; and a variable power supply adapted to provide a range of voltages between the top electrode layer and the readout matrix (see generally Fig. 3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ikeda* as applied to claim 1 above, and further in view of Yamane *et al.* (US 6,330,303 B1).

Regarding claim 4, although *Ikeda* does not specifically identify the thickness of the photoconductive layer, those skilled in the art appreciate that a particular thickness of the photoconductive layer as being between 100 μm and 1000 μm is typical in the art and would have been a matter of routine design choice depending on a variety of factors including such factors as the particular photoconductive material used and the energy of the incident radiation. *Yamane*, for example, discloses a digital x-ray imaging device wherein the selenium photoconductive layer is about 100 μm to 1000 μm (300 μm to 600 μm) thick (col. 3, lines 8-11).

Regarding claim 5, *Yamane* suggests that the photoconductive layer may be about 500 μm thick (i.e., within the range of 300 μm to 600 μm) (col. 3, lines 8-11).

7. Claims 6, 9-10, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ikeda* and further in view of Yamada *et al.* (US 6,163,029).

Regarding claim 6, *Ikeda*, as applied to claim 1 above, does not specifically identify the that the power supply is adapted to provide at least a range of voltages with at least approximately a 2:1 turndown ratio.

Regarding a turndown ratio of approximately 2:1, *Yamada* discloses (Fig. 13) a digital radiation imaging device including a variable bias power supply (97) so as to provide a turndown ratio (col. 14, line 39 to col. 15, line 20). Although *Yamada* does not specify the numeric value of the turndown ratio, *Yamada* does disclose that the applied bias voltages of prior art imaging devices can include bias voltages that span at least 1700 V to 1000 V (see generally Fig. 3B), which suggests a variable power supply providing a turndown ratio of at least about 2:1 (a ratio

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of 1.7:1 is viewed as sufficiently close enough to a ratio of 2:1 so as to be “approximately” a 2:1 ratio.

Yamada discloses that the purpose of supplying the variable range of bias voltages is to allow for a device with a broad dynamic range (i.e., able to be used under a wide range of irradiation conditions) (col. 14, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the system disclosed by *Ikeda* such that the power supply provides a range of voltages with at least approximately a 2:1 turndown ratio, as suggested by *Yamada*, so as to allow for a device that can be used under a wide variety of operating conditions.

The examiner additionally notes that the range of voltages disclosed according to Fig. 3 merely suggests a minimum range of voltages, and that it would have been obvious to a person of ordinary skill in the art to allow for a broader range of voltages so as to maximize the versatility of the device for use under a wide range of irradiation conditions (the purported purpose of variable bias voltage -- col. 14, line 1-9).

Regarding claim 9, *Ikeda* as modified in view of *Yamada* (see explanation regarding claim 6 above) suggests a method of providing a broad dynamic range for a digital imaging device comprising a top (upper) electrode layer; a dielectric layer; a sensor comprising a photoconductive layer and a plurality of pixels, each pixel comprising a charge collection electrode; a thin film transistor readout matrix connected to the charge collection electrode; and a power supply for providing a voltages between the top electrode layer and the readout matrix (see generally *Ikeda*, Fig. 3), the method comprising varying the voltage between the top electrode layer and the readout matrix to provide an acceptable signal-to-noise ratio over a

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greater range of exposures than provided by a single voltage (*Yamada*, col. 14, lines 1-9; and col. 14, line 64 to col. 15, line 3) Note: the expression “reading a minute change of contrast” inherently suggests providing an acceptable signal-to-noise ratio.

Regarding claim 10, *Ikeda* suggests using the method for the non-destructive testing of one or more objects (i.e., a patient) (see generally Fig. 6, ref. no. 9252).

Regarding claim 12, *Yamada* (see explanation regarding claim 6 above) suggests that the range of voltages should be at least between at least 1.0 kV and about 1.7 kV, which overlaps the recited range of between about 1.5, kV and about 3.0 kV.

Regarding claim 14, *Yamada* discloses that varying the bias voltage allows for reading a minute change of contrast (col. 15, lines 1-3) which would suggest to a person of ordinary skill in the art that the method allows for the detection of contrast changes of less than about 2% (the measurement of a change of contrast of less than about 2% is typical in the art -- see also applicant's specification at page 7, lines 10-17), which inherently implies a signal-to-noise-ratio of at least 50:1.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Ikeda* and *Yamane*, as applied to claim 5 above, and further in view of *Yamada*.

Regarding claim 7, *Ikeda* and *Yamane*, as applied to claim 5 above, do not specifically identify the range of voltages provided by the power supply.

Regarding the specific range of voltages, *Yamada* (see explanation regarding claim 6 above), suggests that the range of voltages should be at least between at least 1.0 kV and about 1.7 kV which overlaps the recited range of between about 1.5 kV and about 3.0 kV.

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9. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ikeda* and *Yamada* as applied above, and further in view of *Kramer et al.* (US 5,379,336).

Regarding claim 11, *Ikeda* and *Yamada* do not specifically identify the objects tested as being one of a PC board, a wax or metal casting, a turbine blade or a racket cone.

Regarding the object as being a manufactured object such as a turbine blade, *Kramer* discloses that besides being useful in biomedical imaging applications, solid state digital x-ray imaging devices can be used for non-destructive testing of manufactured objects (abstract), wherein such manufactured objects can include at least printed circuit boards, castings, and turbine blades (col. 2, lines 19-28).

Therefore it would have been obvious to one skilled in the art to modify the method suggested by *Ikeda* and *Yamada* such that the imaging device is used to perform testing on objects such as printed circuit boards, castings, and turbine blades, as suggested by *Kramer*, in view of the known suitability of x-ray imaging devices for such purposes.

Regarding claim 13, *Kramer* suggests using digital x-ray imaging devices for non-destructive testing wherein the range of x-ray energies is from about 1 KeV to greater than 100 KeV (col. 4, lines 17-23) and also greater than 1 MeV (col. 6, line 19 -- the radiation energy of Cobalt 60 is known to be approximately 1.2 MeV) which overlaps the recited range of between about 10 keV to about 10 MeV.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

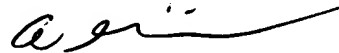
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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert J. Gagliardi whose telephone number is (703) 305-0417.

The examiner can normally be reached on Monday thru Friday from 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (703) 308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Albert J. Gagliardi
Examiner
Art Unit 2878

AJG
July 30, 2002